BEFORE THE
PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA
DOCKET NO. 2021-3-E

In the Matter of:	)	
Annual Review of Base Rates	)	**DIRECT TESTIMONY OF**
for Fuel Costs for	)	**BRETT PHIPPS FOR**
Duke Energy Carolinas, LLC, Increasing	)	**DUKE ENERGY CAROLINAS, LLC**
Residential and Non-Residential Rates	)	

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Brett Phipps. My business address is 526 South Church Street, Charlotte, North Carolina 28202.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed as Managing Director, Fuel Procurement, for Duke Energy Corporation ("Duke Energy"). In that capacity, I directly manage the organization responsible for the purchase and delivery of coal and, up until August 1, 2021, natural gas to Duke Energy's regulated generation fleet, including Duke Energy Carolinas, LLC ("DEC" or the "Company") and Duke Energy Progress, LLC ("DEP") (collectively, the "Companies"). In addition to fuels, I also supervise the procurement of all reagents.

Q. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATIONAL AND PROFESSIONAL EXPERIENCE.

A. I have a Bachelor of Science degree in Chemistry from Marshall University. I began in the mining industry in 1993 where I held various roles associated with surface mining operations. I joined Progress Energy in 1999, holding roles in terminal operations and sales and marketing for Progress Ventures, Progress Energy's unregulated business. I transitioned to the regulated utility in 2005, where I worked in various coal procurement functions and leadership roles, ending as Director, Coal prior to the merger with Duke Energy. In July 2012, upon consummation of the merger between Duke Energy and Progress Energy, I was named as Director, Fuel Procurement. The position was retitled as Managing Director, Fuel Procurement in 2014. I am a member of the American Coal Council, The Coal Institute, the Lexington Coal Exchange, and Southern Gas Association and was previously a board member of the American Coal Council from 2018 to 2020.

Q. PLEASE BRIEFLY DESCRIBE YOUR DUTIES AND RESPONSIBILITIES AS MANAGING DIRECTOR, FUEL PROCUREMENT.

A. As Managing Director, Fuel Procurement, I participate in all aspects of the overall strategic direction and commercial management of the purchase, delivery and storage of fossil fuels that the Duke Energy regulated utilities use for the generation of electricity. This includes monitoring and providing guidance in the various areas of fuel markets, including feedback regarding supply and demand, price, quality, availability, economics and deliverability. These fuel reviews cover both existing and potential future supply sources. I also supervise the Company's coal procurement activity and associated transportation, including the negotiation and administration of long-term and short-term-purchase contracts. In addition to coal, I also supervise procurement of reagents (products used by environmental control systems) and the overall fuel inventories for the regulated fossil generation fleet. Up until August 1, 2021, I also oversaw the procurement of natural gas, fuel oil, and optimization of emission allowances. Duke Energy recently created the new role of Managing Director-Natural Gas and consolidated oversight of natural gas, fuel oil and emissions under that role effective August 1, 2021. The focus of my role will remain on managing the coal supply chain to ensure reliability and cost effective supply. In my role as Managing Director, Fuel Procurement, I provide testimony regarding Duke Energy's fossil fuel procurement practices in Duke Energy Indiana and have done so since 2013. Additionally I provide testimony regarding Duke Energy's fossil fuel procurement practices in Duke Energy Kentucky's fuel proceedings as required.

Q. HAVE YOU TESTIFIED BEFORE THIS COMMISSION IN ANY PRIOR PROCEEDINGS?

A. Yes. I testified before this Commission in DEC's 2017 and 2019 fuel costs proceedings in Docket No. 2017-3-E and Docket No. 2019-3-E as well as in DEP's 2017, 2019, and 2021 fuel costs proceedings in Docket No. 2017-1-E, Docket No. 2019-1-E, and Docket No. 2021-1-E.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to describe DEC's fossil fuel purchasing practices, provide fossil fuel costs for the period June 1, 2020 through May 31, 2021 ("review period") versus June 1, 2019 through May 31, 2020 ("prior review period"), and describe changes forthcoming in the period of October 1, 2021 through September 30, 2022 ("billing period").

Q. YOUR TESTIMONY INCLUDES TWO EXHIBITS. WERE THESE EXHIBITS PREPARED BY YOU OR AT YOUR DIRECTION AND UNDER YOUR SUPERVISION?

A. Yes. These exhibits were prepared at my direction and under my supervision, and consist of Phipps Exhibit 1, which summarizes the Company's Fossil Fuel Procurement Practices, and Phipps Exhibit 2, which summarizes total monthly natural gas purchases and monthly contract and spot coal purchases during the review period and the prior review period.

Q. PLEASE PROVIDE A SUMMARY OF DEC'S FOSSIL FUEL PROCUREMENT PRACTICES.

A. A summary of the Company's fossil fuel procurement practices is set out in Phipps Exhibit 1.

Q. HOW DOES THE COMPANY OPERATE ITS PORTFOLIO OF GENERATION ASSETS TO RELIABLY AND ECONOMICALLY SERVE ITS CUSTOMERS?

A. Both DEC and DEP utilize the same process to ensure that the assets of the Companies are reliably and economically available to serve their respective customers. To that end, both

companies consider factors that include, but are not limited to, the latest forecasted fuel prices, transportation rates, planned maintenance and refueling outages at the generating units, generating unit performance parameters, and expected market conditions associated with power purchases and off-system sales opportunities in order to determine the most economic and reliable means of serving their customers.

Q. PLEASE DESCRIBE DEC'S DELIVERED COST OF COAL AND NATURAL GAS DURING THE REVIEW PERIOD.

A. The Company's average delivered cost of coal per ton for the review period was $80.65 per ton, compared to $85.33 per ton in the prior review period, representing a decrease of approximately 5 percent. The cost of delivered coal includes an average transportation cost of $32.32 per ton in the review period, compared to $29.92 per ton in the prior review period, representing an increase of approximately 8 percent. The Company's average price of gas purchased for the review period was $3.16 per Million British Thermal Units ("MBtu"), compared to $3.06 per million MBtu in the prior review period, representing an increase of approximately 3 percent. The cost of gas is inclusive of gas supply, transportation, storage and financial hedging.

DEC's coal burn for the review period was 6.9 million tons, compared to a coal burn of 7.2 million tons in the prior review period, representing a decrease of 4 percent. The Company's natural gas burn for the review period was 133.1 million MBtu compared to a gas burn of 128.5 million MBtu in the prior review period, representing an increase of approximately 4 percent. As a result of unprecedented load reduction from the COVID-19 pandemic on forecasted summer load in 2020 and extremely low natural gas prices through the early fall, the Company experienced a significant shift in generation from coal to natural

gas in the first half of the review period. Rising natural gas prices coupled with strong weather driven demand have increased gas to coal switching through the latter half of the review period.

Q. PLEASE DESCRIBE THE LATEST TRENDS IN COAL AND NATURAL GAS MARKET CONDITIONS.

A. Coal markets continue to be distressed, and there has been increased market volatility due to a number of factors, including: (1) deteriorated financial health of coal suppliers following the steep declines in coal generation demand resulting from low natural gas prices, accelerated coal retirements and, most recently, COVID-19 economic shut-downs; (2) natural gas price volatility; (3) uncertainty around proposed, imposed, and stayed U.S. Environmental Protection Agency regulations for power plants; (4) changing demand in global markets for both steam and metallurgical coal; (5) uncertainty surrounding regulations for mining operations; (6) tightening access to investor financing coupled with deteriorating credit quality is increasing the overall costs of financing for coal producers; and, (7) continued tightening in overall production levels limiting suppliers' operational flexibility.

Declining demand for coal in the utility sector is also driving rail transportation providers to modify their business models to be less dependent on coal related transportation revenues. While there remains adequate coal transportation availability, the Company's rail transportation providers have indicated that they will have limited operational flexibility to adapt to significant changes in scheduling demand resulting from the Company's burn volatility, specifically in higher than forecasted coal burn scenarios.

With respect to natural gas, the nation's natural gas supply has grown significantly over the last several years as producers enhanced production techniques, increased

efficiencies, and lowered production costs. Natural gas prices are reflective of the dynamics between supply and demand factors, and in the short term, such dynamics are influenced primarily by seasonal weather demand, overall storage inventory balances, changes to export demand and production. While there continues to be adequate natural gas production capacity to serve increased market demand, pipeline infrastructure permitting and regulatory process approval efforts are challenged due to increased reviews and interventions, which can delay and change planned pipeline construction and commissioning timing. Specifically, cancellation of the Atlantic Coast Pipeline which was terminated July 5, 2020, will limit the Company's access to low cost natural gas.

Over the longer term planning horizon, natural gas supply is projected to continue to increase, while the pipeline infrastructure needed to move the growing supply to meet demand related to power generation, liquefied natural gas exports and pipeline exports to Mexico is highly uncertain.

Q. WHAT ARE THE PROJECTED COAL AND NATURAL GAS CONSUMPTIONS AND COSTS FOR THE BILLING PERIOD?

A. DEC's current coal burn projection for the billing period is 4.4 million tons compared to 6.9 million tons consumed during the review period. DEC's billing period projections for coal generation may be impacted due to changes from, but not limited to, the following factors: (1) delivered natural gas prices versus the average delivered cost of coal; (2) volatile power prices; and (3) electric demand. Combining coal and transportation costs, DEC projects average delivered coal costs of approximately $69.94 per ton for the billing period compared to $80.65 per ton in the review period. This includes an average total projected transportation cost of $28.72 per ton for the billing period, compared to $32.32 per ton in the review period. This

projected average delivered coal cost, however, is subject to change based on, but not limited to, the following factors: (1) exposure to market prices and their impact on open coal positions; (2) the amount of non-Central Appalachian coal DEC is able to consume; (3) performance of contract deliveries by suppliers and railroads, which may not occur despite DEC's strong contract compliance monitoring process; (4) changes in transportation rates; and (5) potential additional costs associated with suppliers' compliance with legal and statutory changes.

DEC's current natural gas burn projection for the billing period is approximately 215.6 million MBtu, compared to the 133.1 million MBtu consumed during the review period. The net increase in DEC's overall natural gas burn projections for the billing period versus the test period is driven by the inclusion of natural gas generation at Belews Creek, and Marshall Units 3 & 4 as a result of the dual fuel conversions being commercially available over the course of the billing period, combined with increased generation output from the Lincoln CT project. The current average forward Henry Hub price for the billing period is $2.75 per million MBtu, compared to $2.44 per million MBtu in the review period. Projected burn volumes will vary based on factors such as, but not limited to, changes in commodity prices and weather driven demand.

Q. WHAT IMPACTS DOES DEC ANTICIPATE DUE TO THE DECLINES IN EXPECTED COAL BURNS AND CHANGES IN THE ABILITY OF THE RAILROAD TO MEET SIGNIFICANT CHANGES IN COAL DEMAND?

A. First, the Company's Fixed/Variable coal rail transportation contracts that expired June 30, 2021 did not provide ongoing customer value in a declining coal burn environment. Second, declining operational flexibility on the part of the Company's coal rail transportation providers will limit their ability to adapt timely to significant changes in coal demand. As an

alternative to returning to a flat conventional rate structure, the Company negotiated a 100 percent variable tiered pricing contract structure with the goal of achieving a structure that provides incremental customer value (as compared to a 100 percent variable flat conventional rate structure) and supports secure, reliable deliveries in an overall lower coal burn environment.

Q. HAS THIS NEW RAIL RATE STRUCTURE IMPACTED THE COMPANY'S UNIT COMMITMENT AND DISPATCH MODELING? IF SO HOW HAS THE COMPANY INCORPORATED THE NEW TIERED PRICING INPUTS?

A. Yes, DEC anticipated that moving to a new tiered contract structure would require a more dynamic input process to incorporate the new tiered pricing structure into the Company's unit commitment and dispatch modeling process. The rail transportation pricing input in unit commitment and dispatch will be the current Weighted-Average Balance of Contract Transportation Rate ("Weighted-Average Rate"), updated weekly. The process for calculating the current Weighted-Average Rate will be to use the Company's stochastic production cost model to estimate the remaining coal tons to be delivered for the balance of the contract period and calculate the weighted-average transportation rate for those tons based on the contract's tiered rate structure and tons already delivered. Then, that Weighted-Average Rate is used in the next unit commitment and dispatch decisions. This rate is recalculated every week to account for updated actual delivered tons and changes in the projected final tons as other inputs (e.g., fuel prices) change in the production cost model.

Q. PLEASE PROVIDE A BRIEF DESCRIPTION OF THE COMPANY'S STOCHATIC PRODUCTION COST MODEL.

A. The stochastic model uses historic weather information to simulate numerous scenarios of future weather and commodity prices. For each of these scenarios, system load and commodity prices (gas, coal, oil and power) are all calculated in a correlated manner using historical correlations with each other and with weather. The resulting forecasts of this stochastic model gives the Company not only expected fuel burns, but also the range of fuel burns and the probability associated with each range.

Q. WHAT OTHER STEPS IS DEC TAKING TO ENSURE A COST-EFFECTIVE RELIABLE FUEL SUPPLY?

A. The Company continues to maintain a comprehensive coal and natural gas procurement strategy that has proven successful over the years in limiting average annual fuel price changes, while actively managing the dynamic demands of its fossil fuel generation fleet in a reliable and cost-effective manner. With respect to coal procurement, the Company's procurement strategy includes (1) having an appropriate mix of contract and spot purchases for coal; (2) staggering coal contract expirations in order to limit exposure to market price changes; and (3) diversifying coal sourcing as economics warrant, as well as working with coal suppliers to incorporate additional flexibility into their supply contracts. The Company conducts spot market solicitations throughout the year to supplement term contract purchases, taking into account changes in projected coal burns and existing coal inventory levels.

The Company has implemented natural gas procurement practices that include periodic Requests for Proposals and shorter-term market engagement activities to procure and actively manage a reliable, flexible, diverse, and competitively priced natural gas supply. These procurement practices include contracting for volumetric optionality in order to provide flexibility in responding to changes in forecasted fuel consumption. DEC continues to

maintain a short-term natural gas hedging plan to manage fuel cost risk for customers via a disciplined, structured execution approach. DEC continues to monitor and make adjustments as necessary to its natural gas hedging program.

Lastly, DEC procures long-term firm interstate and intrastate transportation to provide natural gas to its generating facilities. Given the Company's limited amount of contracted firm interstate transportation, the Company participates in the capacity release market to purchase shorter term firm interstate pipeline capacity as available. The Company's firm transport ("FT") provides the underlying framework for the Company to manage the natural gas supply needed for reliable cost-effective generation. First, it allows the Company access to lower cost natural gas supply from Transco Zone 3 and Zone 4 and the ability to transport it to Zone 5 for delivery to the Carolinas' generation fleet. Second, it allows the Company to manage intraday supply adjustments on the pipeline through injections or withdrawals of natural gas supply from storage, including on weekends and holidays when the gas markets are closed. Third, it allows the Company to mitigate imbalance penalties associated with Transco pipeline restrictions, which can be significant. The Company's customers receive the benefit of each of these aspects of the Company's FT: access to lower cost gas supply, intraday supply adjustments at minimal cost, and mitigation of punitive pipeline imbalance penalties.

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes, it does.

Duke Energy Carolinas, LLC Fossil Fuel Procurement Practices

Coal

- Near and long-term coal consumption is forecasted based on inputs such as load projections, fleet maintenance and availability schedules, coal quality and cost, non-coal commodity and emission prices, environmental permit and emissions constraints, projected renewable energy production, and wholesale energy imports and exports.
- Station and system inventory targets are developed to provide generational reliability, insulation from short-term market volatility, and adaptability to evolving coal production and transportation conditions. Inventories are monitored continuously.
- On a continuous basis, existing purchase commitments are compared with consumption and inventory requirements to determine changes in supply needs.
- All qualified suppliers are invited to participate in Request for Proposals to satisfy additional supply needs.
- Spot market solicitations are conducted on an on-going basis to supplement existing purchase commitments.
- Contracts are awarded based on the highest customer value, considering factors such as price, quality, transportation, reliability and flexibility.
- Delivered coal volume and quality are monitored against contract commitments. Coal and freight payments are calculated based on certified scale weights and coal quality analysis meeting ASTM standards as established by ASTM International.

Gas

- Near and long-term natural gas consumption is forecasted based on inputs such as load projections, commodity and emission prices, projected renewable energy production, and fleet maintenance and availability schedules.
- Physical procurement targets are developed to procure a cost effective and reliable natural gas supply.
- Natural gas supply is contracted utilizing a portfolio of long term, short term, spot market and physical call option agreements
- Short-term and long-term Requests for Proposals and market solicitations are conducted with potential suppliers, as needed, to procure the cost competitive, secure, and reliable natural gas supply, firm transportation, and storage capacity needed to meet forecasted gas usage.
- Short-term and spot purchases are conducted on an on-going basis to supplement term natural gas supply.
- On a continuous basis, existing purchases are compared against forecasted gas usage to determine changes in supply and transportation needs.
- Natural gas transportation for the generation fleet is obtained through a mix of long-term firm transportation agreements, and shorter-term pipeline capacity purchases.
- A targeted percentage of the natural gas fuel price exposure is managed via a rolling 60-month structured financial natural gas hedging program.

- Through the Asset Management and Delivered Supply Agreement between Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, LLC implemented on January 1, 2013, DEC serves as the designated Asset Manager that procures and manages the combined gas supply needs for the combined Carolinas gas fleet.

Fuel Oil

- No. 2 fuel oil is burned primarily for initiation of coal combustion (light-off at steam plants) and in combustion turbines (peaking assets).
- All No. 2 fuel oil is moved via pipeline to applicable terminals where it is then loaded on trucks for delivery into the Company's storage tanks. Because oil usage is highly variable, the Company relies on a combination of inventory, responsive suppliers with access to multiple terminals, and trucking agreements to manage its needs. Replenishment of No. 2 fuel oil inventories at the applicable plant facilities is done on an "as needed basis" and coordinated between fuel procurement and station personnel.
- Formal solicitations for supply may be conducted as needed with an emphasis on maintaining a network of reliable suppliers at a competitive market price in the region of our generating assets.

DUKE ENERGY CAROLINAS
Summary of Coal Purchases
Twelve Months Ended May 2021 & 2020
Tons

Line No.	Month	Contract (Tons)	Net Spot Purchase and Sales (Tons)	Total (Tons)
1	June 2020	306,915	11,563	318,478
2	July	395,057	50,851	445,908
3	August	548,061	25,831	573,892
4	September	400,170	99,692	499,862
5	October	531,876	52,647	584,523
6	November	360,487	111,351	471,838
7	December	326,439	52,176	378,615
8	January 2021	323,175	272,905	596,080
9	February	178,088	352,765	530,853
10	March	307,174	179,526	486,700
11	April	244,734	259,026	503,760
12	May	214,001	267,134	481,135
13	**Total** (Sum L1:L12)	**4,136,177**	**1,735,467**	**5,871,644**

Line No.	Month	Contract (Tons)	Net Spot Purchase and Sales (Tons)	Total (Tons)
14	June 2019	647,313	140,296	787,609
15	July	692,046	77,088	769,134
16	August	732,253	115,963	848,216
17	September	469,275	204,304	673,579
18	October	471,409	231,850	703,259
19	November	397,228	239,441	636,669
20	December	560,959	202,536	763,495
21	January 2020	719,300	39,752	759,052
22	February	377,885	130,203	508,088
23	March	511,418	51,906	563,324
24	April	454,145	23,566	477,711
25	May	203,960	12,873	216,833
26	**Total** (Sum L14:L25)	**6,237,191**	**1,469,778**	**7,706,969**

DUKE ENERGY CAROLINAS
Summary of Gas Purchases
Twelve Months Ended May 2021 & 2020
MBTUs

Line No.	Month	MBTUs
1	June 2020	9,651,972
2	July	13,975,803
3	August	12,871,773
4	September	11,262,855
5	October	11,076,024
6	November	9,927,112
7	December	10,055,686
8	January 2021	15,219,115
9	February	10,438,520
10	March	10,115,378
11	April	8,394,699
12	May	10,080,567
13	**Total** (Sum L1:L12)	**133,069,504**

Line No.	Month	MBTUs
14	June 2019	10,195,827
15	July	12,505,061
16	August	12,104,186
17	September	12,459,839
18	October	8,409,940
19	November	5,772,711
20	December	10,423,250
21	January 2020	13,098,158
22	February	13,151,481
23	March	13,043,284
24	April	6,893,840
25	May	10,414,617
26	**Total** (Sum L14:L25)	**128,472,194**